



TRR 181 Cruise Poseidon 523 2 – 23 May 2018



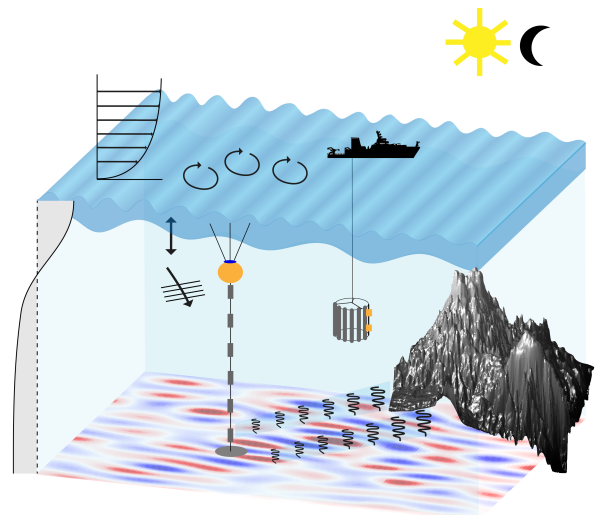
1. Weekly report (7 May 2018)

The Poseidon cruise Pos523 is part of the TRR 181, an interdisciplinary research program of the Deutsche Forschungsgemeinschaft (DFG). The topic of TRR181 'Energy transfers in atmosphere and ocean' is the representation of the oceanic and atmospheric energy cycles in climate models. Pos523 is the second expedition to the area south of the Azores within the TRR181 after last years' Pos516. The shipboard party is formed by 10 scientists of the Universities Bremen and Hamburg, the University of Victoria and the University of the Azores Horta.

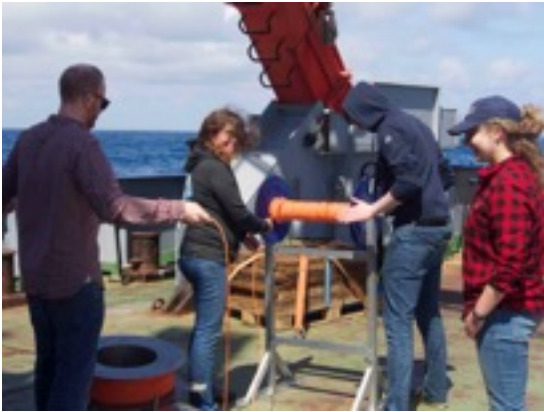
The oceans' interior is not at rest. Movement exists in all direction and on a variety of scales that range from basin wide current systems to the millimetres of small scale turbulent motion. The main energy sources for these motions are wind and tides. The interaction between the different scales and the exchange of energy is not well understood. Tidal forcing, for example, excites so-called internal tides at steep topography as seamounts and the continental shelf. These internal tides have the form of underwater waves that may travel hundreds of kilometres across ocean basins. Along their paths, the waves lose their energy by a range of processes and interactions, but the how and where is mostly unknown.

Our project has the aim to better understand the fluxes and dissipation of this tidal energy in the ocean interior to improve the representation of these processes in climate models. We do this by observing the distribution of internal wave energy along a path, a so-called tidal beam emanating from the seamount chain south of the Azores toward the Cape Verde Islands. Our main instrumentation is a CTD probe. CTD stands for Conductivity, Temperature, Depth, the main parameter the instrument measures and records. The CTD is part of an instrument package that is lowered from the ship to the seafloor, thus delivering full depth profiles of the water column. The rest of the package consists of a water sampling carousel and a set of acoustic current meters (Lowered acoustic Doppler current meter, LADCP).

During this cruise, we will occupy several longterm stations of up to 48 hours, where we will alternately measure full depth CTD/LADCP profiles and shallow (approximately 500m) profiles of turbulence measurements in the upper ocean. Further, we will recover and redeploy a long term mooring designed to record the temporal variability in the internal



Schematic of the tidal beam south of the Azores (red/blue), and our instrumentation to observe it: the CTD/LADCP below the ship, and the mooring to observe temporal variability.



Preparing the winch for microstructure turbulence observations.

wave energy fluxes and the upper ocean turbulence. The mooring was deployed during last years' Poseidon 516 cruise and is equipped with several current meters and temperature loggers.

On Wednesday, May 2, we left Malaga in the morning in calm and sunny weather, passed the Strait of Gibraltar in the afternoon and set course towards our working area. The 5-day trip to the position of our first station leaves plenty of time to install and test our instruments, and fortunately everything is working fine. We are all looking forward to Tuesday morning, when we will finally start our first time series station with CTD, LADCP, and microstructure profiling.

Best wishes from the subtropical Atlantic to all friends, families and colleagues on shore, Maren Walter and the scientific party of POS523



Leaving Malaga.